Guide rails to keep us off the lecture circuit

Paul Magnuson
November 2016

I skyped with John Miller of Agile Classrooms this week and learned a new term. Maybe it's a term common for agile practitioners, but it was new to me.

Guide rails are those things on our mountain road that help prevent all but the most determined drivers from the long plummet to the valley below. Guide rails are any sort of edge to a channel that helps direct things in a certain. Like the bumpers that you can lower at bowling alleys so your eight year old doesn't roll gutterball after gutterball.

Guide rails, bumpers. To help move something in the way you want it to go, without crashing or ending up in the gutter.

Here's how John and I got to that discussion this week.

For the past two years, Bill (IT) and Dan (biology) have been working on a concept for a unit they call Robot Gardeners. The idea is to help students construct a garden in a terrarium that will flourish even if no one is tending it. No one to water it, no one to check on the temperature. Except for the robotics.

The robotics are parts from Arduino that are reasonably enough priced for us to have multiple sets for students. Motherboard, power source, fan, temperature gauge, relays, and wires are all there for the students, as well as basic computer programs to begin with.

Dan and Bill have a presentation coming up at the annual ECIS conference for international educators. They had invited teachers so they could give their presentation a dry run and get some feedback. Ten teachers arrived to be the guinea pigs participants. They divided into groups of two or three at tables. Each table had a box of Arduino parts and a simple kanban board with:

- To Do
- Doing
- Stuck
- Review, and
- Done.

Dan and Bill handed out a list of tasks they wanted the participants to complete and a diagram of a circuit. After just a bit of explanation of how to use the kanban board, the participants dug

in, moving stickies into doing and then review as they got acquainted with the parts, reviewed the circuit diagram, downloaded the Arduino software on their PowerBooks, and began building.

When participants got stuck they got help from Dan and Bill and, as the presentation demo went on, participants increasingly went to each other for help. Not everything was smooth, of course. The circuit diagram wasn't drawn exactly right and the directions for downloading the software was missing a step. Some participants were less comfortable being asked to sit and think and struggle when they got stuck (or thought they might be stuck) and other participants seemed quite happy to figure things out.

What I noticed, though, and what made me feel so good during their test run, were the guard rails.

Reflecting now, there were actually two types of guardrails in play. First, the lesson was planned in such a way that participants moved in the direction Dan and Bill had planned. They had some easy, early successes by naming the Arduino pieces and identifying where the supporting documents for the lesson were on the class website. Those two stickies quickly went from doing to review and, after Dan or Bill circulated past, to done. First little missions accomplished. As it got harder, Dan and Bill gave provided encouragement and a bit more direction direction, as participants needed it, to get unstuck. The participants were working between the guard rails, heading in the direction Dan and Bill intended.

Second, and this really piqued my interest as an observer, the lessons was planned in such a way that Dan and Bill *themselves* stayed between the guard rails, too. Their guard rails kept them teaching in a manner that was necessarily lots of teacher circulation with very little whole group instruction. The kanban boards made the tasks so visually clear that participants could work independently. The work of the participants then erected the guard rails that kept Dan and Bill headed down the intended path, where they were busy working with participants who had put stickies in Stuck and checking in with participants who had moved Stickies to Review. Once started, Dan and Bill found it naturally inconvenient to revert to a lecture style, teacher fronted, presentation.

For me, that was mission accomplished. The big mission. The guard rails kept Dan and Bill on a path where participants had to self-regulate and teachers had to assist. The independence of the lesson, supported by the visibility of kanban board and supporting materials, set participants and teachers alike on a particular course. It kept the participants testing and thinking and discussing and, well, failing and trying again, and asking each other, and troubleshooting. No big lectures here. There was no room for them.

If the agile mindset is a blend of thinking and doing, perhaps we can think ourselves as teachers into a state of teaching and learning in which we create guard rails for our students - and *ourselves* - so that, once we start down this road, we can neither fall off the path, nor go back to how we used to teach. I believe I saw exactly that in the Robot Gardener lesson.

Paul can be contacted at pmagnuson@las.ch.